Trend Study 23-2-03

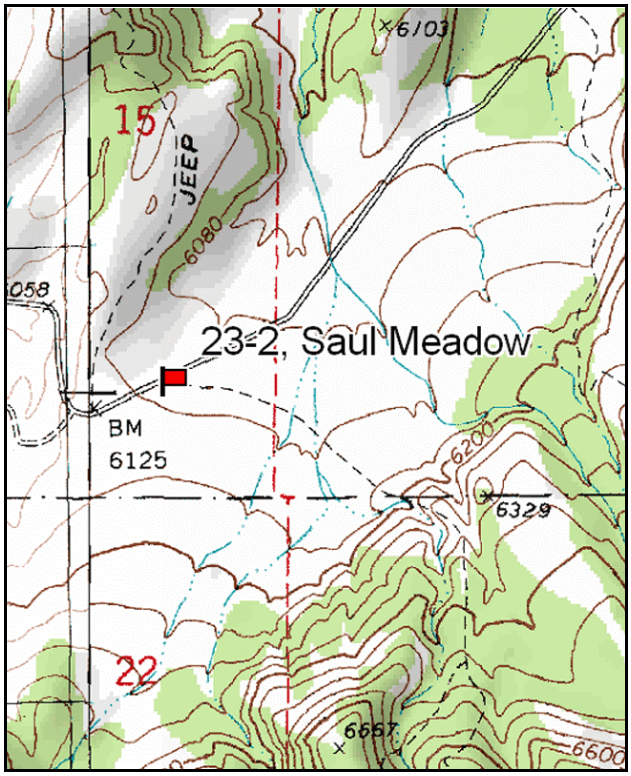
Study site name: Saul Meadow . Vegetation type: Big Sagebrush-Grass .

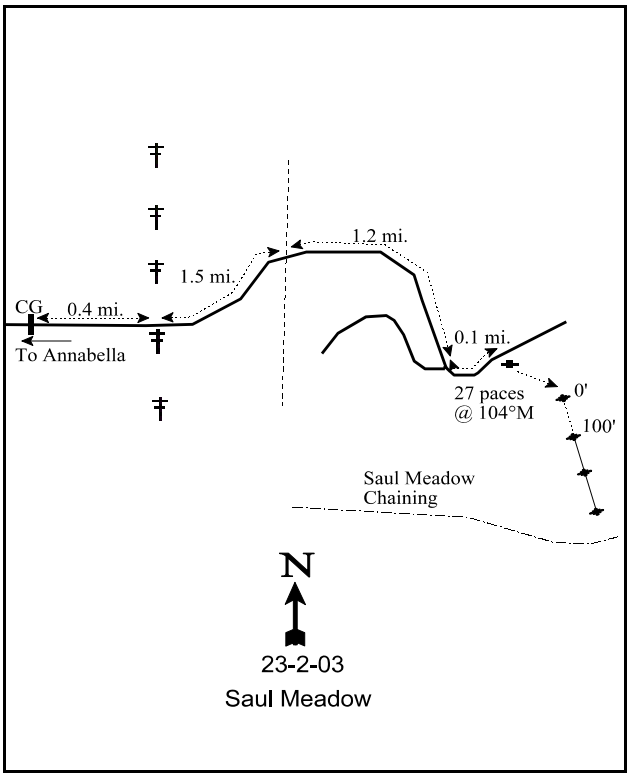
Compass bearing: frequency baseline 167 degrees magnetic.

Frequency belt placement: line 1 (11 & 71ft), line 2 (34 & 95ft), line 3 (59ft).

LOCATION DESCRIPTION

Starting from the Annabella cemetery go northeast 0.1 miles to a cattleguard. Bear left and go 0.4 miles crossing under a powerline. Continue 1.5 miles to the BLM boundary sign, then 1.2 miles more to a fork in the road. Continue straight 0.1 miles on the main road to a green and yellow fencepost on the right. The rebar marking the 0-foot end of the frequency baseline is 27 paces at 104 degrees magnetic from the green and yellow fencepost (which marks the start of a pellet transect).





Map Name: Water Creek Canyon

Diagrammatic Sketch

Township 24S , Range 2W , Section 15

GPS: NAD 27, UTM 12S 4284668 N, 413213 E

DISCUSSION

Saul Meadow - Trend Study No. 23-2

The Saul Meadow trend site is located on BLM land that was chained and aerially seeded with crested wheatgrass in 1965. Some juniper trees have become reestablished, but Wyoming big sagebrush is presently the dominant species. Point-centered quarter data estimated juniper density at only 19 trees/acre in 1998, with an average diameter at just over 5 inches. All juniper trees on the site were hand cut sometime prior to the 2003 reading and no live trees were encountered. Currently, the seeding has permits for 22 AUM's for cattle in May, June, and October. Sheep do not use this portion of the allotment. Deer use has generally been moderate in the area as determined by the DWR Maple Creek pellet group transect. A pellet group transect read parallel to the trend study baseline in 1998 and 2003 estimated moderately heavy to moderate deer use at respectively 97 deer days use/acre (239 ddu/ha) and 59 deer days use/acre (146 ddu/ha). Elk use was estimated at 19 days use/acre (47 edu/ha) in 1998 and 10 days use/acre (25 edu/ha) in 2003. Cattle use was low during both readings.

The site is located on a dry, gentle northeast facing slope (3-5%) on the northwest side of the Monroe Mountains. The soil developed on an old alluvial fan from sandstone, shale, quartzite, and limestone parent materials. The light-brown soil is a sandy loam which is neutral in reactivity (pH 6.6). Effective rooting depth was estimated at almost 17 inches with a relatively cool average soil temperature of 55° F at 18 inches in depth in 1998. Soil temperature was much higher in 2003, averaging 79° F at just over 12 inches in depth. This trend study was read in July of 1998 and July of 2003. The difference in soil temperature is related to soil moisture, indicating a much drier soil profile in 2003 compared to 1998. Precipitation data from 2003 indicate drier than normal conditions in 2001 and 2002. Spring precipitation (April - June) was only 44% of normal in 2003, resulting in a much drier soil profile compared to 1998. Organic matter content is comparatively low at only 1.2%, indicating a low site potential. Phosphorus is also low at 8.6 ppm, which could be a limiting factor to plant development. Litter and vegetative cover are good around and under the sagebrush plants and junipers, although the interspaces are mostly bare soil or have a cover of annuals and pavement. Erosion has not been a serious problem because of the negligible slope, but should be monitored closely. The erosion condition class was determined to be stable in 2003.

The key browse species is Wyoming big sagebrush. The sagebrush population appeared healthy and expanding in 1985 and 1991. Seedlings and young plants were abundant. Most of the larger plants were moderately hedged, but some individuals had been heavily browsed. The more heavily browsed plants were hybrids between Wyoming big sagebrush and mountain big sagebrush. The larger sample used in 1998 estimated 2,840 plants/acre. Use was moderate and vigor normal on most plants. The number of decadent plants was moderately high at 44%. Density remained similar in 2003, at just over 3,000 plants/acre. Use was mostly light. The number of decadent plants decreased and the number of young plants increased to 31% of the population.

Cover and diversity of herbaceous species is low. The most common perennial species is crested wheatgrass. It grows tall and vigorous, but only under the protection of the sagebrush. Cheatgrass grows mostly in the shrub interspaces providing 61% of the herbaceous cover in 1998 and 43% in 2003. Forbs are rare and consist mostly of small, low-value annuals.

1985 APPARENT TREND ASSESSMENT

Soil conditions appear stable. Soil movement is kept to a minimum by the gentle terrain. In terms of the key species, their form, vigor, and age class distribution appear stable. However, the community is slowly changing as many junipers, not controlled with the chaining, have been released from adult competition and are quickly growing to maturity.

1991 TREND ASSESSMENT

Most measured parameters for soil did not change except for percent pavement and bare ground. Bare ground increased from 21% to 31%, while percent pavement decreased from 25% to 16%. This increase in bare ground indicates a slight downward trend for soil which should be watched closely. This could be just an effect of the drought, which effects litter and vegetative cover. The Wyoming big sagebrush has shown an increase of 16% in it's population, but it's percent decadency has gone up from 12% to 52%. Another critical parameter is that the percentage of the population that is expressing poor vigor has gone from 5% up to 24% in 1991. These downward changes could directly be attributed to the extended drought, but percent decadency and vigor should improve with more normal precipitation patterns. There are not very many species of grasses or forbs on the site. However, trend for herbaceous understory is up slightly since the last inventory.

TREND ASSESSMENT
soil - slightly downward (2)
browse - slightly downward (2)
herbaceous understory - slightly upward, but still in poor condition (4)

1998 TREND ASSESSMENT

Trend for soil is slightly up with percent bare soil decreasing from 31% to 22%. The only key browse species is Wyoming big sagebrush, which is continuing to show downward trends for most of the measured parameters. Trend for browse is down slightly. Trend for the herbaceous understory is stable, with sum of nested frequency remaining relatively unchanged.

TREND ASSESSMENT
soil - slightly up (4)
browse - down slightly (2)
herbaceous understory - stable (3)

2003 TREND ASSESSMENT

Trend for soil is considered down slightly. Percent cover of bare ground has increased from 22% to 35%, and conversely, litter and vegetation cover have declined. However, there is not much erosion occurring due to the gentle terrain. Trend for the key browse species, Wyoming big sagebrush, is up slightly. Density and average vigor are similar to 1998 estimates, although the number of decadent plants has declined from 44% to 28%. Use is mostly light with young plants being more abundant, accounting for 31% of the population. Trend for the herbaceous understory is stable but poor. The only common perennial grass, crested wheatgrass, has remained stable for nested frequency. One positive aspect of the herbaceous trend is the decline in nested frequency and cover of cheatgrass. Forbs are rare and consist of a few annual species.

TREND ASSESSMENT
soil - down slightly (2)
browse - up slightly (4)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Management unit 23 , Study no: 2

Type	Species	Nested Frequency				Average Cover %	
		'85	'91	'98	'03	'98	'03
G	Agropyron cristatum	97	114	132	135	7.03	6.89
G	Bromus tectorum (a)	-	-	$_{b}$252	$_{a}$228	11.73	5.92
G	Sitanion hystrix	$_{a}$4	$_{b}$26	$_{ab}$10	$_{ab}$11	.45	.31
G	Vulpia octoflora (a)	-	-	-	7	-	.01
Total for Annual Grasses		0	0	252	235	11.73	5.94
Total for Perennial Grasses		101	140	142	146	7.49	7.20
Total for Grasses		101	140	394	381	19.22	13.14
F	Alyssum alyssoides (a)	-	-	2	4	.00	.01
F	Eriogonum cernuum (a)	6	5	-	-	-	-
F	Euphorbia spp.	-	-	2	-	.00	-
F	Gayophytum ramosissimum(a)	-	-	3	3	.00	.00
F	Ranunculus testiculatus (a)	-	-	$_{a}$-	$_{b}$13	-	.06
F	Sisymbrium altissimum (a)	$_{a}$-	$_{b}$19	$_{a}$-	$_{b}$19	-	.65
F	Stephanomeria pauciflora	3	-	-	-	-	-
Total for Annual Forbs		6	24	5	39	0.00	0.72
Total for Perennial Forbs		3	0	2	0	0.00	0
Total for Forbs		9	24	7	39	0.01	0.72

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 23 , Study no: 2

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia tridentata wyomingensis	78	75	12.83	14.86
B	Atriplex canescens	0	1	-	-
B	Gutierrezia sarothrae	2	0	-	-
B	Juniperus osteosperma	3	0	2.00	-
B	Opuntia spp.	4	2	-	-
Total for Browse		87	78	14.83	14.86

CANOPY COVER, LINE INTERCEPT --
Management unit 23 , Study no: 2

Species	Percent Cover	
	'98	'03
Artemisia tridentata wyomingensis	-	12.03
Juniperus osteosperma	1.39	-
Opuntia spp.	-	.08

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 23 , Study no: 2

Species	Average leader growth (in)
	'03
Artemisia tridentata wyomingensis	1.4

POINT-QUARTER TREE DATA --
Management unit 23 , Study no: 2

Species	Trees per Acre	
	'98	'03
Juniperus osteosperma	19	N/A

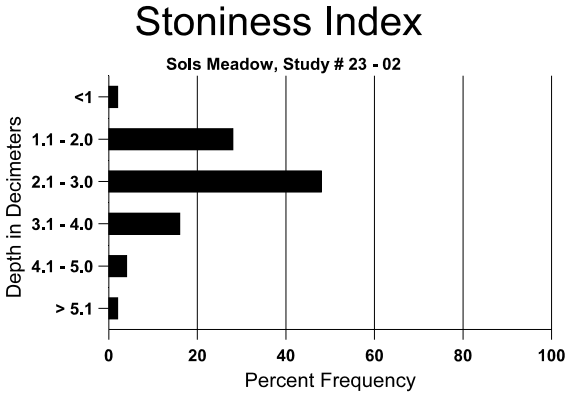
Average diameter (in)	
'98	'03
5.4	N/A

BASIC COVER --
Management unit 23 , Study no: 2

Cover Type	Average Cover %			
	'85	'91	'98	'03
Vegetation	5.00	3.75	31.53	27.32
Rock	5.00	2.00	4.00	4.58
Pavement	25.00	16.00	7.97	8.46
Litter	44.25	46.00	45.56	36.73
Cryptogams	0	1.50	1.85	1.64
Bare Ground	20.75	30.75	21.92	34.51

SOIL ANALYSIS DATA --
Management unit 23, Study no: 2, Study Name: Saul Meadow

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
16.9	79.0 (12.1)	6.6	62.0	19.4	18.6	1.2	8.6	115.2	0.5



PELLET GROUP DATA --
Management unit 23 , Study no: 2

Type	Quadrat Frequency '98	Quadrat Frequency '03	Days use per acre (ha) '98	Days use per acre (ha) '03
Rabbit	57	68	-	-
Elk	11	3	18 (44)	10 (25)
Deer	52	36	94 (232)	59 (145)
Cattle	1	2	4 (10)	1 (4)

BROWSE CHARACTERISTICS --
Management unit 23 , Study no: 2

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis											
85	**5398**	600	2266	2466	666	-	36	22	12	5	18/23
91	**6399**	200	1133	1933	3333	-	25	1	52	24	26/30
98	**2840**	40	240	1340	1260	1520	45	4	44	14	24/31
03	**3060**	40	940	1260	860	1500	12	1	28	13	24/32
Atriplex canescens											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**40**	-	-	40	-	-	0	0	-	0	-/-

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Gutierrezia sarothrae											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**40**	-	-	40	-	-	0	0	-	0	6/8
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Juniperus osteosperma											
85	**0**	-	-	-	-	-	0	0	-	0	-/-
91	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**60**	-	-	60	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	20	0	0	-	0	-/-
Opuntia spp.											
85	**1599**	-	333	1000	266	-	0	0	17	8	4/9
91	**1332**	66	400	866	66	-	15	0	5	0	5/6
98	**80**	-	-	60	20	20	0	0	25	25	4/6
03	**40**	-	-	40	-	-	0	0	0	0	6/16